

CLAIMS

We claim:

1. A method to maintain a communications connection through a firewall in a network used for pushing information to and receiving information from a mobile device, comprising:
 - a. sending a first heartbeat signal between the mobile device and an asset server;
 - b. receiving the first heartbeat signal at the firewall;
 - c. opening a hole in the firewall to allow communication between the mobile device and the asset server;
 - d. holding the hole open for a first set period of time; and,
 - e. sending a successive communication before the set period of time expires, wherein the successive communication causes the firewall to leave the hole open for a second set period of time.
2. A method according to claim 1, wherein the network is a wireless network.
3. A method according to claim 1, wherein the network is a packet-switched network.
4. A method according to claim 1, wherein the successive communication is information the mobile device sends to the asset server through the hole.
5. A method according to claim 4, wherein the mobile device is part of an asset in an asset tracking system.
6. A method according to claim 5, wherein the sent information pertains to an asset position.
7. A method according to claim 6, wherein the asset position is information about one of GPS coordinates, directions, speed, LORAN position, street address.
8. A method according to claim 7, wherein the GPS coordinates are provided by a GPS receiver communicatively coupled to the mobile device.

9. A method according to claim 5, wherein the sent information pertains to an asset status.
10. A method according to claim 9, wherein the asset is a vehicle.
11. A method according to claim 10, wherein the asset status is information about one of speed, direction, airbag deployed, engine on, tire pressure, fuel level.
12. A method according to claim 9, wherein the asset is a person.
13. A method according to claim 12, wherein the asset status is information about one of a body temperature, a heartbeat, a blood pressure, a blood sugar level, or a respiration rate.
14. A method according to claim 1, wherein the successive communication is information the mobile device receives from the asset server through the hole.
15. A method according to claim 14, wherein the asset server includes at least one parser and a message switch.
16. A method according to claim 14, wherein the mobile device is part of an asset in an asset tracking system.
17. A method according to claim 16, wherein the received information pertains to at least one other asset in the asset tracking system.
18. A method according to claim 16, wherein the received information pertains to a position to which the asset should proceed.
19. A method according to claim 18, wherein the received information includes real-time information.
20. A method according to claim 19, wherein the real-time information is about a status of a location at the position.

21. A method according to claim 20, wherein the real-time information includes one of blueprints, occupancy, items stored at the location, a history of the location, or a history of occupants at the location.
22. A method according to claim 21, wherein the real-time information is about one of a traffic condition, a light signal, a traffic accident, a best route, or a parking condition.
23. A method according to claim 19, wherein the real-time information is imagery of the position.
24. A method according to claim 23, wherein the imagery includes satellite imagery.
25. A method according to claim 1, wherein the successive communication is a successive heartbeat.
26. A method according to claim 1, wherein the heartbeat signal is specific to the mobile device that originates the heartbeat.
27. A method according to claim 26, wherein the heartbeat is a digital signal, wherein the digital signal includes at least one bit that identifies the mobile device.
28. A method according to claim 1, wherein the asset server includes at least one parser and a message switch.
29. A method according to claim 28, wherein the message switch receives and processes signals from a plurality of mobile devices.
30. A method according to claim 29, wherein the message switch routes signals to at least one connected device or system.
31. A method according to claim 30, wherein the connected system includes one of a customer system, a database, or mobile device.
32. A method according to claim 1, wherein the mobile device is a cellular device.

33. A method according to claim 32, wherein the cellular device sends and receives digital signals.
34. A method according to claim 33, wherein the cellular device includes a digital modem to send data to and receive data from the cellular network.
35. A method according to claim 34, wherein the cellular device multiplexes a plurality of data streams into an out-going data stream.
36. A method according to claim 35, wherein the plurality of data streams includes one of voice data, asset position data, asset status data, the heartbeat, or mobile device identifier.
37. A method according to claim 1, wherein a first heartbeat includes a dynamic IP address for the mobile device.
38. A method according to claim 1, wherein the asset server record the dynamic IP address to communicate with the mobile device in the future.
39. A communication system to maintain a hole in a firewall, comprising
- a. a mobile device;
 - b. a wireless network connected in communication with the mobile device, wherein the wireless network includes a firewall;
 - c. an asset server connected in communication to the cellular network; and,
 - d. wherein a first heartbeat sent between the mobile device and the asset server opens the hole in the firewall and at least one successive communication maintains the hole.
40. A communication system according to claim 39, wherein the mobile device is a cellular device.
41. A communication system according to claim 39, wherein the wireless network is a cellular network.

42. A communication system according to claim 39, wherein the wireless network is a packet-switched network.
43. A communication system according to claim 39, wherein the communications system is part of an asset tracking system.
44. A communication system according to claim 43, wherein the mobile device is part of an asset in the asset tracking system.
45. A communication system according to claim 44, wherein the mobile device sends information to the asset server through the hole.
46. A communication system according to claim 45, wherein the sent information pertains to an asset position.
47. A communication system according to claim 46, wherein the asset position is information about one of GPS coordinates, directions, speed, LORAN position, or street address.
48. A communication system according to claim 47, wherein the GPS coordinates are provided by a GPS receiver communicatively coupled to the mobile device.
49. A communication system according to claim 45, wherein the sent information is at least one telemetry measure pertaining to an asset status.
50. A communication system according to claim 49, wherein the asset is a vehicle.
51. A communication system according to claim 50, wherein the asset status is information about one of speed, direction, airbag deployed, engine on, tire pressure, fuel level.
52. A communication system according to claim 49, wherein the asset is a person.
53. A communication system according to claim 52, wherein the asset status is information about one of heartbeat, body temperature, blood pressure, blood sugar level, or respiration rate.

54. A communication system according to claim 39, wherein the asset server pushes information to the mobile device through the hole.
55. A communication system according to claim 54, wherein the pushed information pertains to at least one other asset in the asset tracking system.
56. A communication system according to claim 54, wherein the pushed information pertains to a position to which the asset should proceed.
57. A communication system according to claim 56, wherein the pushed information includes real-time information.
58. A communication system according to claim 56, wherein the real-time information includes information about a status of a location at the position.
59. A communication system according to claim 58, wherein the real-time information includes one of blueprints, occupancy, items stored at the location, a history of the location, a history of occupants at the location.
60. A communication system according to claim 39, wherein the successive communication is a successive heartbeat.
61. A communication system according to claim 39, wherein the heartbeat is specific to the mobile device that originates the heartbeat.
62. A communication system according to claim 61, wherein the heartbeat is a digital signal, wherein the digital signal includes a plurality of bits that identify the mobile device.
63. A communication system according to claim 39, wherein the cellular device sends and receives digital signals.
64. A communication system according to claim 39, wherein the cellular device includes a digital modem to send data to the wireless network.

65. A communication system according to claim 39, wherein the cellular device multiplexes a plurality of data streams into an out-going data stream.
66. A communication system according to claim 65, wherein the plurality of data streams includes one of voice data, asset position data, asset status data, the heartbeat, or mobile device identifier.
67. A communication system according to claim 39, wherein the asset server comprises:
- a. a plurality of parsers; and,
 - b. a message switch coupled in communication to the plurality of parsers.
68. A communication system according to claim 67, wherein the parser receives and sends information to the mobile device.
69. A communication system according to claim 68, wherein a first parser receives and sends information from a cellular device and a second parser receives and sends data to a different communication device.
70. A communication system according to claim 69, wherein the different communication device is one of a radio transmitter, a satellite phone, a remote computer, a private radio network, or a landline phone network.
71. A communication system according to claim 67, wherein the first parser receives information from and sends information to the cellular device information in a first format and the second parser receives information from and sends information to a different communication device in a second format.
72. A communication system according to claim 71, wherein the first parser and the second parser receive information from and send information to the message switch information in a standard format.

73. A communication system according to claim 67, wherein the message switch routes the information.
74. A communication system according to claim 73, further comprising at least one systems coupled in communication to the message switch.
75. A communication system according to claim 74, wherein the coupled system includes one of a customer system, a database, or another mobile device.
76. A communication system according to claim 75, wherein the database stores information from at least one parser.
77. A communication system according to claim 74, wherein the information sent to the coupled system is in a standardized application program interface.
78. An asset tracking device to send data to and receive data from an asset server in an asset tracking system, comprising:
- a. an electronic position finder; and
 - b. a mobile device coupled in communication to the electronic position finder, wherein the mobile device sends at least one heartbeat to the asset server, and the heartbeat creates or maintains a hole in a firewall in a wireless network connecting the mobile device to the asset server.
79. An asset tracking device according to claim 78, wherein the electronic position finder is one of a GPS receiver or a LORAN receiver.
80. An asset tracking device according to claim 79, wherein the GPS receiver sends GPS coordinates to the mobile device to send to the asset server.
81. An asset tracking device according to claim 80, wherein the mobile device sends information to the asset server through the hole.

82. An asset tracking device according to claim 81, wherein the information sent to the asset server includes GPS coordinates.
83. An asset tracking device according to claim 78, wherein the asset server pushes information to the mobile device through the hole.
84. An asset tracking device according to claim 83, wherein the pushed information includes real-time information.
85. An asset tracking device according to claim 84, wherein the real-time information is about one of at least on other asset in the asset tracking system, a location, a direction, or a voice communications
86. An asset tracking device according to claim 85, wherein the information about the location includes one of a blueprint of the location, an address of the location, a number of occupants at the location, an item of information about the occupants of the location, an item stored at the location, a photograph of the location, a map of the location, or a history of the location.
87. An asset tracking device according to claim 78, further comprising an operating system coupled in communication to the mobile device.
88. An asset tracking device according to claim 87, further comprising an array of sensors coupled in communication to the operating system, wherein the array of sensors monitor an asset using the asset tracking device.
89. An asset tracking device according to claim 88, wherein the asset is one of a vehicle, a person, an aerial vehicle, a train car, a water vessel, or a container.
90. An asset tracking device according to claim 89, wherein the array of sensors monitor the vehicle for one of a tire pressure, a fuel level, an airbag deployment, an engine operation, a plow height, a siren operation, or a water pump operation.

91. An asset tracking device according to claim 89, wherein the array of sensors monitor the person for one of a body temperature, a heartbeat, a blood pressure, a blood sugar level, or a respiration rate.
92. An asset tracking device according to claim 88, wherein the array of sensors sends the collected information to the operating system.
93. An asset tracking device according to claim 92, wherein the operating system processes the collected information.
94. An asset tracking device according to claim 93, wherein the operating system relays the information to the mobile device to be sent to the asset server.
95. An asset tracking device according to claim 93, further comprising a display device coupled in communication to the operating system.
96. An asset tracking device according to claim 95, wherein the operating system sends the collected information to a display device.
97. An asset tracking device according to claim 95, wherein the display device shows a plurality of information to be sent by the mobile device or received by the mobile device.
98. An asset tracking device according to claim 97, wherein the display device shows GIS information of an area surrounding a position of the vehicle.
99. An asset tracking device according to claim 98, wherein the GIS information includes a satellite photograph of the area surrounding a position of the vehicle.
100. An asset tracking device according to claim 98, wherein the GIS information includes a route to take to get to the location.
101. An asset tracking device according to claim 78, wherein the heartbeat is periodic.
102. An asset tracking device according to claim 78, wherein the heartbeat is sporadic.

103. An asset tracking device according to claim 78, wherein the heartbeat is triggered by an event.
104. An asset server in an asset tracking system to send data to and receive data from a mobile device, comprising:
- a. at least one parser;
 - b. a message switch, wherein the message switch receives from or sends to the mobile device at least one heartbeat, and wherein the heartbeat creates or maintains a hole in a firewall in a wireless network connecting the asset server to the mobile device.
105. An asset server according to claim 104, wherein the parser receives asset information from the mobile device to input into the asset tracking system.
106. An asset server according to claim 105, wherein the asset information includes one of an asset position, an asset status, an asset direction.
107. An asset server according to claim 106, wherein the asset position includes one of asset direction, asset coordinates, asset address location.
108. An asset server according to claim 106, wherein the asset is a vehicle.
109. An asset server according to claim 108, wherein the asset status includes one of tire pressure, fuel level, airbag deployment, engine operation, plow height, siren operation, water pump operation.
110. An asset server according to claim 108, wherein the asset is a person.
111. An asset server according to claim 108, wherein the asset status includes one of body temperature, heartbeat, blood pressure, blood sugar level.

112. An asset server according to claim 104, wherein the first parser receives from and sends to the cellular device information in a first format and the second parser receives from and sends to the different communication device information in a second format.
113. An asset server according to claim 112, wherein the first parser and the second parser receive from and send to the message switch information in a standard format.
114. An asset server according to claim 104, wherein the parser receives and sends information to the mobile device.
115. An asset server according to claim 104, wherein a first parser receives and sends information from a cellular device and a second parser receives and sends data to a different communication device.
116. An asset server according to claim 115, wherein the different communication device is one of a radio transmitter, a satellite phone, a remote computer, a private radio network, or a landline phone network.
117. An asset server according to claim 104, further comprising a database coupled in communication with the data server.
118. An asset server according to claim 117, wherein the database stores information sent to the data server through the hole.
119. An asset server according to claim 104, wherein the heartbeat is periodic.
120. An asset server according to claim 104, wherein the heartbeat is sporadic.
121. An asset server according to claim 104, wherein the heartbeat is triggered by an event.
122. An asset tracking system to locate and manage a plurality of assets, comprising
 - a. a cellular device located with each asset, wherein the cellular device transmits a periodic heartbeat, and wherein the cellular device includes

- i. a cellular modem; and,
 - ii. a GPS receiver coupled to the cellular modem, wherein the GPS receiver sends GPS coordinates to the cellular modem for transmission;
- b. a wireless, packet-switched network coupled in communication to the cellular device that receives the GPS coordinates, wherein the cellular network includes
 - i. a wireless interface that receives the transmitted GPS signals from the cellular modem;
 - ii. a firewall, wherein the firewall opens a hole upon receipt of the heartbeat, and wherein the firewall maintains the hole for successive communications between the cellular modem and an asset server;
 - iii. a network router, wherein the router relays the heartbeat that passes through the firewall onto an internet network; and
- c. an asset server coupled to the internet network, wherein the asset server receives the heartbeats from the cellular device, and wherein the asset server includes:
 - i. at least one parser;
 - ii. a message switch coupled to the parser.